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(54) Winding Spool

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Specification

Winding Spool

The invention relates to a winding spool comprising two lateral flange disks and a winding barrel, the spool preferably being made of plastic and in the form of a single piece and being used particularly for winding conductors, which are sensitive to kinking and are guided through a lateral opening out of the winding space defined by the flange disks and the winding barrel. It is known that fiber optic cables made of glass are normally extremely sensitive to kinking. Additionally, they can break as a result of sharp edges or transitions. In the case of windings spool known so far, at least one of the lateral flange disks is provided with an opening for the purpose of feeding the conductors, which opening is configured as a cylindrical bore or elongated hole. Even if the edges are done manually, breakage or kinking cannot be excluded since corresponding smooth transmissions cannot be achieved.

It is the object of the invention to configure a winding spool of the type described above such that even when winding materials that are sensitive to kinking damage or buckling can be

excluded without changing the basic design of the winding spool.

The object is achieved in that the opening is disposed in a cover-like flange insert, which is connected to a lateral flange disk 11, 12, and that the opening extends on both sides in the arch enlarging the cross-section.

The flange-like insert ensures that compared to the familiar design the length of the opening is enlarged by the wall thickness of the cover's bottom. The cover's bottom is suitably in contact with the outer surface of the flange disk. In the center region, the opening has the smallest cross-section, which increases continually in the direction towards the winding space and also to the side facing away from the winding space, without forming edges and lugs. Like before, the opening is disposed towards the outside adjacent to the inside of the flange of the winding space. Additionally, the opening may extend from the barrel to the outer edge of the flange. The flange insert is inserted in a bore of the flange disk. Said bore is configured larger to ensure a sufficiently large cross-section for the opening. When retrofitting existing winding spools, the existing opening would have to be increased to the corresponding size. The wall thickness of the bottom of the cover-like flange insert, which bottom rests against the flange disk, allows the determination of the length of the opening. By configuring the opening according to the invention, the cross-section increases in a funnel shape starting in the center region. It is provided in a preferred embodiment that the smallest cross-section of the opening is located in the region of the flange disk's center. For the purpose of laterally leading out the conductors that are supposed to be wound and for inserting the start of the winding material, it is particularly advantageous if the diameter of the opening facing the winding space is smaller than the diameter facing away from the winding space.

The opening can also be configured differently. Particularly preferred embodiments, however, are circular, elongated hole or segment shape configurations, viewed from the front, respectively, i.e. looking at the flange disk. The lug of the flange insert is configured such that it has a sealing effect on the inside of the flange disk. This can be achieved in that the lug of the flange insert is configured such that it can be pressed into the bore of the flange disk with moderate pressure.

To ensure that the flange insert does not detach during the winding operation, it is provided that it is connected to the flange disk for example by means of gluing or welding.

The invention will be explained in more detail hereinafter with reference to the figures, wherein:

Figure 1 shows a winding spool according to the invention in a longitudinal sectional view,

Figure 2 shows a detail in a sectional view, which illustrates the flange insert with the opening, which insert is placed on the flange disk,

Figure 3 shows the flange disk according to Figure 1 from the front,

Figure 4 is a partial front view corresponding to Figure 3, illustrating another embodiment of the opening.

The winding spool 10 illustrated in Figure 1 comprises the two lateral flange disks 11, 12 and a winding barrel 13, which is covered with an elastic barrel coating 14 on the outside. The outer edges of the flange disks 11, 12 have a honeycomb design. The two flange disks 11, 12 are provided with a bore 15, respectively, adjacent to the winding barrel 13 and/or the barrel coating 14. Cover-like flange inserts 16 are attached on the outside to the flange disks 11, 12 by means of welding or gluing. These flange inserts 16 are provided with lugs 17, which comprise an opening 18, on the sides facing the winding barrel 13.

Figure 2 shows that the opening 18 extends in an arch on either side. The smallest cross-section forming the parting plane for pins during the injection molding operation is located roughly in the center of the flange disk 11 or 12. The arch extending in the direction towards the winding barrel 13 is tighter than the arch extending to the opposite side. Accordingly, the opening 18 has a funnel shape towards either side. The lug 17 is configured such that it engages in the bore 15 of the respective flange disk 11 or 12 and therefore has a sealing effect.

The flange insert 16 is welded or glued to the flange disk 11, which is not illustrated in detail. Additionally, the diameter of the opening 18 on the side facing the winding barrel 13 is smaller than that of the opposite side. Furthermore, the outer diameter of the cover-like

flange insert 16 is larger than that of the winding barrel 13. Particularly Figure 1 shows that each flange insert 16 comprises a tubular lug 19 on the inside.

Figure 3 shows that the opening 18 is disposed at such a distance to the axis of rotation of the winding spool 10 that the end of the conductor that is supposed to be wound is placed on the circumference of the barrel coating 14. In the embodiment according to Figure 3, the opening 18 is circular, when looking at the flange disk 11 or 12.

Figure 4 illustrates that the opening 18 in this view can also be configured as an elongated hole. It could also be designed in a segment shape – which is not shown - resulting basically in turn again in an elongated hole shape, however the center of the radius of curvature is then the axis of rotation of the winding spool 10.

The invention is not limited to the illustrated sample embodiments. The essential factor is the flange insert 16, which is fastened to the respective flange disk 11 or 12, the insert comprising openings 18, the cross-sectional dimensions of which increase on either side. The winding spool 10 and the flange insert 16 are made of plastic in an injection molding process.

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Claims

1. A winding spool comprising two lateral flange disks and a winding barrel, the spool preferably being made of plastic and in the form of a single piece and being used particularly for winding conductors that are sensitive to kinking and are guided through a lateral opening out of the winding space defined by the flange disks and the winding barrel, **characterized in that** the opening (18) is disposed in a cover-like flange insert (16) that is connected to a lateral flange disk (11, 12) and in that the opening (18) extends on either side in an arch, the cross-section of which increases.

2. A winding spool according to claim 1, **characterized in that** the smallest diameter of the opening (18) is located in the center region of the flange disk (11, 12).

3. A winding spool according to any one or several of the above claims 1 to 2, **characterized in that** the cross-section of the opening facing the winding space is smaller than the cross-section facing away from the winding space.

4. A winding spool according to any one or several of the above claims 1 to 3, **characterized in that** the opening, viewed from the front, has a circular, elongated hole or segment shape configuration.

5. A winding spool according to any one or several of the above claims 1 to 4, **characterized in that** the opening (18) of the flange insert (16) is located in the area of the winding barrel (13) or the barrel surface (14).

6. A winding spool according to any one or several of the above claims 1 to 5, **characterized in that** the winding spool (10) and the flange insert (16) are made of the same material or of different materials.

7. A winding spool according claim 6, **characterized in that** the winding spool (10) is made of plastic having a hardness that is greater than that of the flange insert (16).

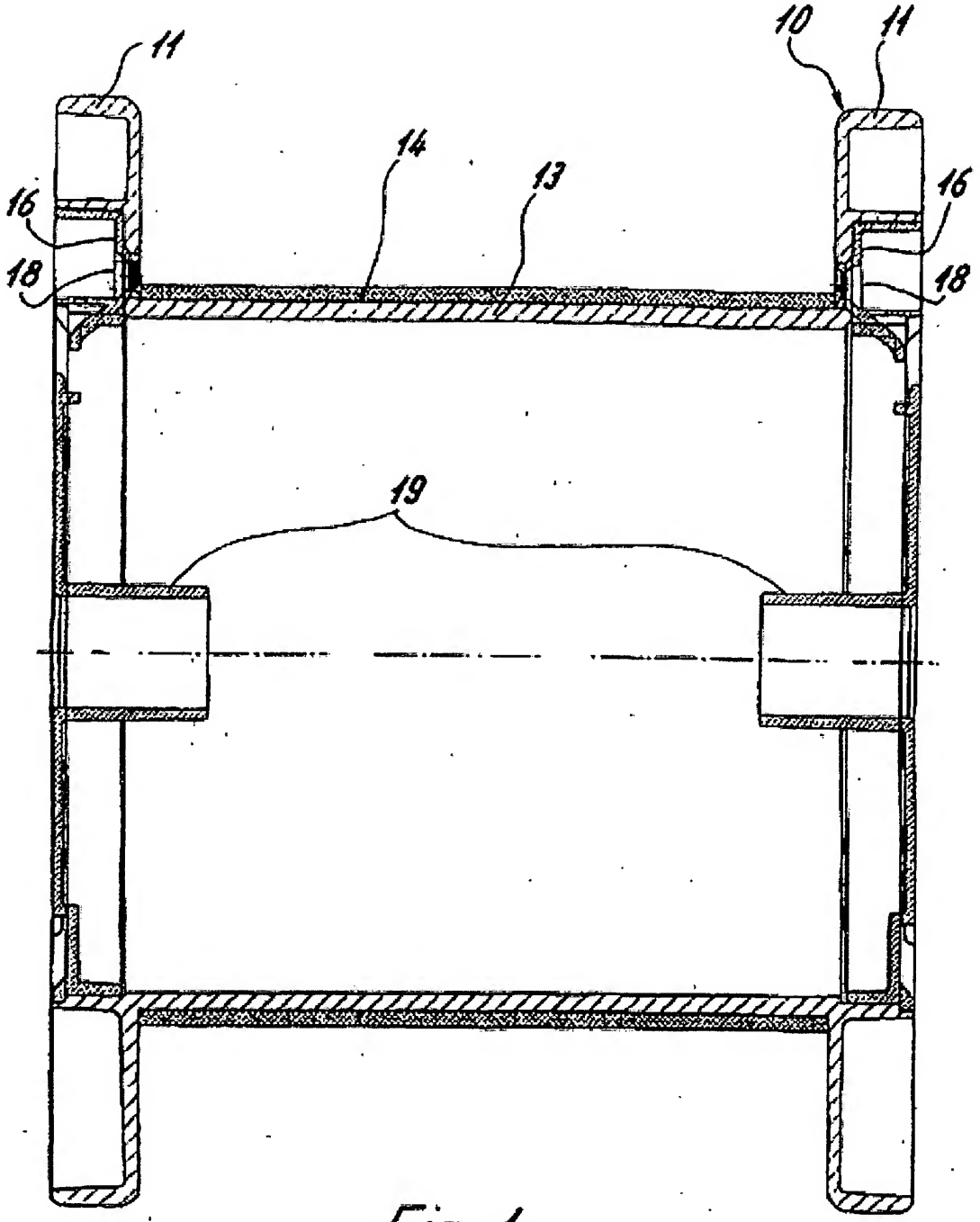

Fig. 1

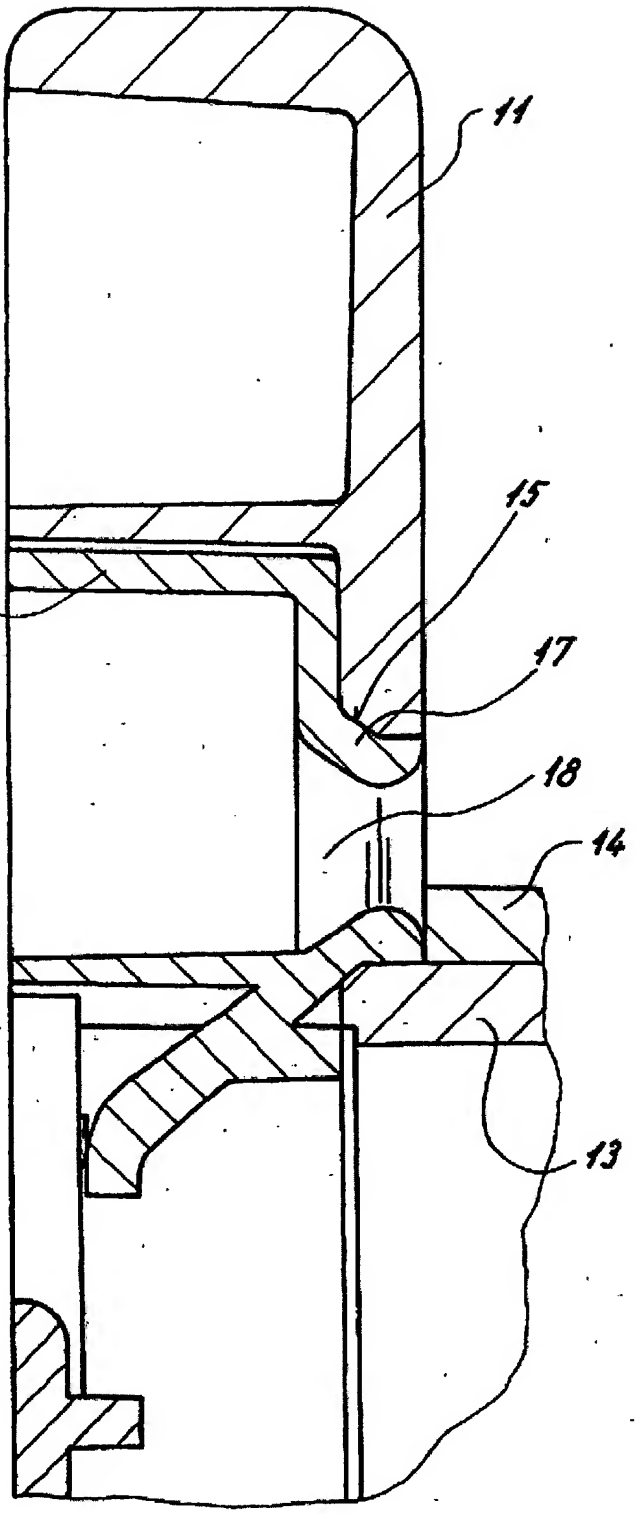

Fig. 2

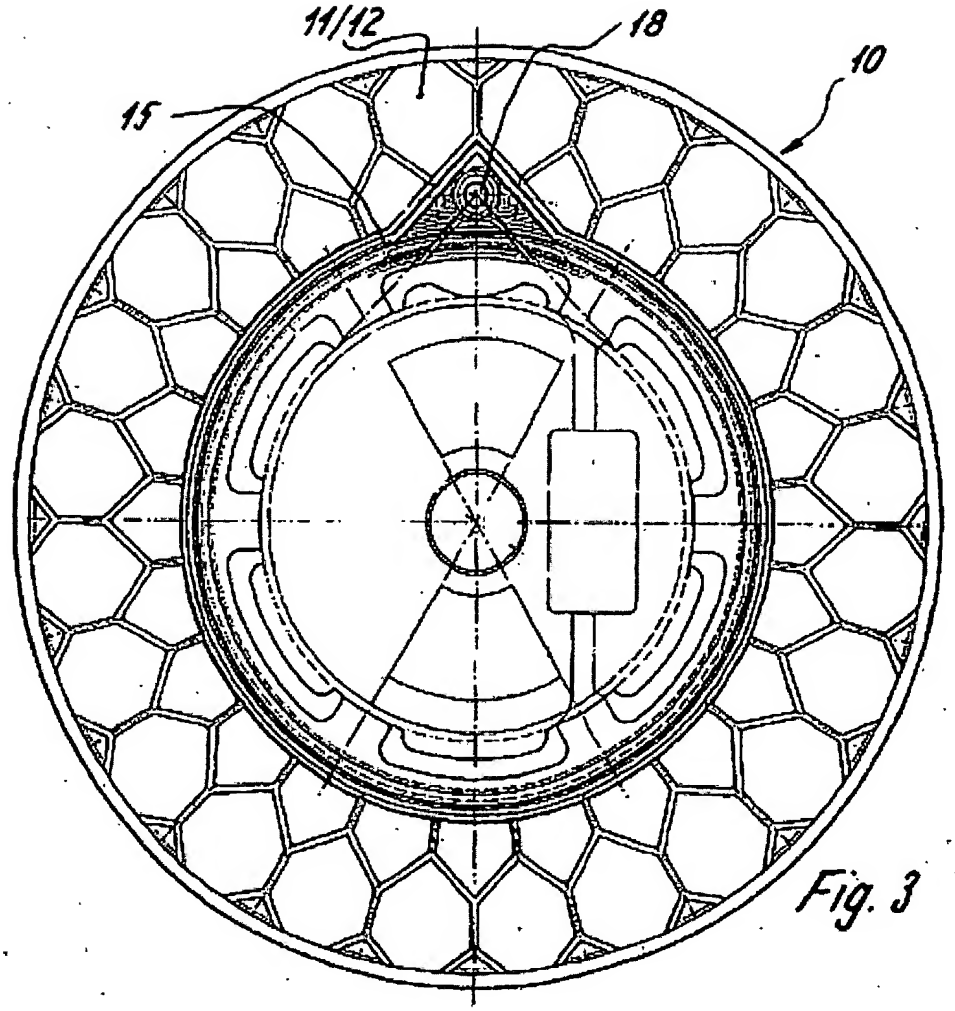

Fig. 3

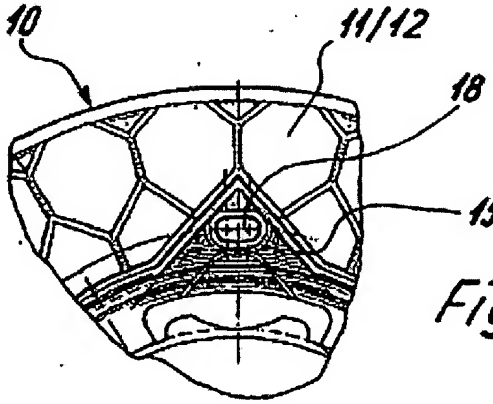

Fig. 4

TRANSLATOR CERTIFICATION

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Morningside | Translations

I, Kerstin Roland, a translator fluent in the German language, on behalf of Morningside Evaluations and Consulting, do solemnly and sincerely declare that the following is, to the best of my knowledge and belief, a true and correct translation of the document(s) listed below in a form that best reflects the intention and meaning of the original text.

MORNINGSIDE EVALUATIONS AND CONSULTING

Kerstin Roland

Signature of Translator

Description of Documents Translated:
DE 298 07 873 U1: Winding Spool

Date: February 20, 2006